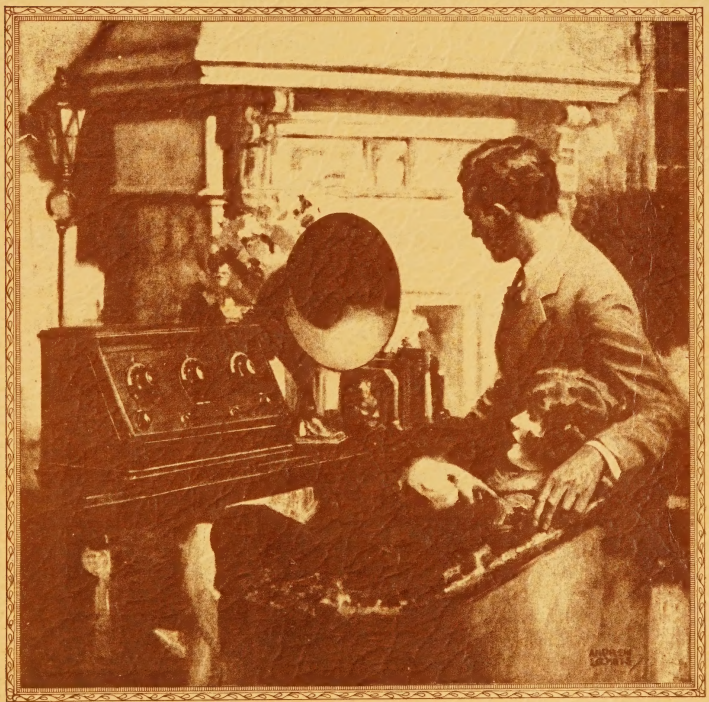
California Antique Radio Gazette

Official Journal, Southern California Antique Radio Society.

VOLUME 7 FEBRUARY 1982 NUMBER 1



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SCARS ROSTER - Jan. 1983

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Southern California Antique Radio Society

The Southern California Antique Radio Society (SCARS) is a non-profit organization. Its purpose is to preserve the history of wireless communication by encouraging the acquisition, preservation and exhibition of antique wireless and radio apparatus and publications pertaining to its history and development.

SCARS promotes social contacts through meetings held four times a year in various locations of Southern California. Featured at these meetings are contests, swap sessions and talks by members and guests on subjects of interest to collectors.

The club publishes quarterly the SCARS Newsletter or SCARS Gazette. Each one features articles of historical interest, news of club actitities, hints on restoration and advertisement of radio related items available for sale or swap. These ads are printed free for members.

Membership is open to anyone having a genuine interest in preserving the equipment and history of early wireless and radio development. Dues are $10.00 per year. Fill out the accompanying application form and send it to the club Treasurer

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12-82 REV4

Featured Set

The US Navy SE-2465A Aircraft DF Receiver

By Bob Herbig

As a "former Naval person" as Winston Churchill used to say, and after 30 years in the Navy as a radioman and electronics officer, I have keen interest in early US Navy radio equipment.

The receiver to be described—the SE-2465A Aircraft DF Receiver—was built in the late 20's, and of course differs greatly from WWI types in size and components used. The letters SE stand for the Navy Bureau of Steam Engineering, the bureau that was responsible for the funding and letting of contracts for equipment.

Figures 1 and 2 show the front panel and top view of the receiver. This set was manufactured by the Westinghouse Electric Company in 1927 to Navy specifications. It was designed for use in large seaplanes and has a tuning range of 200 to 650 Hz. The dimensions are 13¾" wide by 9¼" deep. It weighs 15 pounds without the B batteries.

The circuit consists of a RF amplifier stage, regenerative detector and two audio stages. The four tubes are Western Electric 215A types (Navy designation CW-1344). These tubes are quite rugged and in spite of their small size develop a strong signal at the audio output terminals. The CW-1344 tube had three different filament voltage ratings, identified by the color of the glass tip on top of the tube as follows.

Red Tip. . . . . .0.8 to 0.9 volts
Clear Tip . . . . . .0.8 to 1.0 volts
Blue Tip . . . . . .1.0 to 1.1 volts

Best tube efficiency was obtained by operating the tubes at the filament voltage listed above (taken from a chart attached to the underside of the tube access lid, located at the rear of the cabinet top).

The voltmeter on the top right side of the front panel is a Weston Model 506, 2½" diameter type. It is a dual scale instrument. The top scale is 0-60 volts DC with a red mark at 45 to indicate normal plate voltage. The bottom scale is 0-2 volts and has a red, white and blue mark at the center for adjusting voltage according to the tube tip-color. This Weston meter is designated by the Navy as a SE-2971.

The two 4" vernier tuning dials are MARCO type with a tuning ratio of 10:1. Each dial, in addition to the window at the top, has a smaller window at each side for station logging. For instance, 200 meters comes in at "97," and 650 meters is at "4" on the scale.

The pointer knob above the left hand 4" dial is the antenna inductance switch. The left hand position grounds the antenna, the 2nd and 3rd positions increase selectivity and the 4th position is for broad tuning.

The lever switch to the left of the meter is used for switching from normal receive to DF with the loop connected to the receiver. The three binding posts above this switch are connections for loop leads. The two binding posts at the left are for the regular antenna and ground. The two binding posts at the right hand side of the panel are for the filament battery. At the top right hand side of the panel is located the regeneration control, a 5000 ohm rheostat, connected from the cold end of the tickler winding through a 0.001 mfd capacitor to ground. The filament rheostat is located between the two tuning dials and below it can be seen the phone jack.

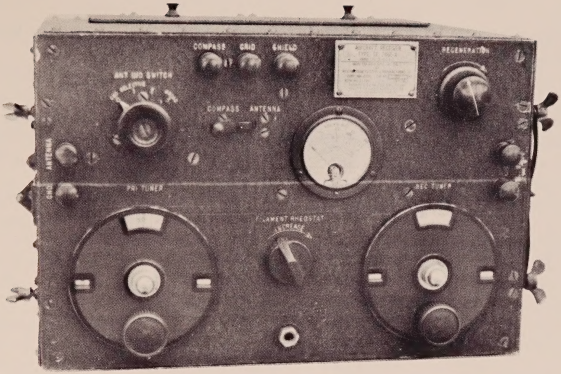

Figure 1

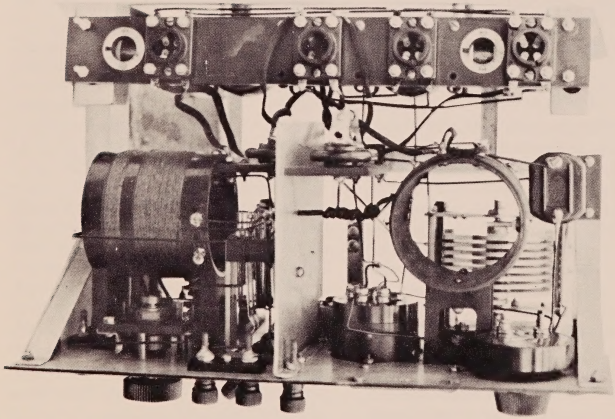

Figure 2

As can be seen in Figure 2, the panel is attached to a heavy aluminum framework that also supports the tube shelf. Note the metal shield between the antenna and grid coils. The tube shelf is made from bakelite and mounted on rubber supports at each end. Also note a unique idea, two dummy tube sockets at each end of the tube shelf that hold two spare tubes.

In the top view can be seen the antenna coil at the left and the detector coil at the right with one of the Cardwell type "C" condensers visible under the detector coil. These variable condensers are unusual in that the plates are cast aluminum and tapered to give a straight-line wavelength tuning curve.

Brown Sangamo molded by-pass condensers are used in this set because of their high stability and moisture proof construction.

It was interesting to discover that since the set was manufactured by Westinghouse, the two audio transformers are the same types as those used in the Radiola III and IIIA BC sets.

Also to be seen in Figure 2 is the heavy bus wire used; #14 enameled. Typical of most aircraft radio equipment, all nuts have been soldered to the screw threads to prevent them from coming loose from engine vibration.

The RF amplifier stage is neutralized by means of a "gimmick" condenser consisting of ten turns of insulated bus wire wound over the leads between the grid and the inside end of the plate winding, this winding being tapped.

Two 45 volts "B" batteries measuring 4" by 3" by 2" are contained in the frame at the rear on each side, and connected to binding posts on two terminal strips. The batteries are connected in parallel.

The cabinet is made from aluminum sheet riveted together and is typical of the construciton used by the US Navy up into WWII. There is a 13½" by 9" schematic of the set pasted to the rear wall of the cabinet.

SOS Answered

Bruce McCalley joined SCARS at the last meeting and recently has answered the SOS sent out by your Editor for help in publishing the Gazette. Bruce is certainly more than qualified, editing and publishing "The Vintage Ford" – official publication of the Model T Ford Club of America. The copy he gave me contains 56 pages of exciting photos of Model T's and excellent articles, some written by Bruce like, "Letters," wherein very technical questions from members are answered impressively by Bruce. Bruce showed ye SCARS Editor how to layup a galley and has offered to typeset future Gazettes. Thanks Bruce – we'll make it yet! If you are interested in "Vintage Ford," contact Bruce via "The Model T Ford Club of America," Box 7400, Burbank, California 91510-7400, Telephone (213) 842-2010." (Editor)

SCARS Two Meter Net

The monthly "Antique Radio Roundtable on the Air" is now thriving on a 2-meter repeater in the Los Angeles area. The sessions are conducted at 8PM on the last Friday of the month for approximately 2 hours. A wide variety of topics on radio history and collecting are aired, in addition to SCARS activities and tips on the restoration, storing and exhibiting of vintage radios. Tune in and turn on!

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Tube Article

Tubes of the Battery-Set Era

By Roy and Kathryn Tucker

There were dozens of different tube types used in the 1920's battery-set broadcast receivers, but a collector can obtain nine types (or even twelve types) and claim a most representative collection. The vast majority of tubes used were developed by RCA's two parent companies, General Electric and Westinghouse. Their tubes were all quite similar—triodes which were all conveniently interchangeable if proper voltages were applied and socket adaptations made.

Two basic tube designs were involved. These could be described as the six volt battery filament power type and the 1½ volt No. 6 dry cell filament power type. The biggest share of production went to the storage battery line, designed for a 5 volt filament by means of a rheostat adjustment.

A series of five tubes emerged in 1920 starting with the 01. This tube was such a standard that the entire series could be referred to as the "01" family. These were the basic 01 for all RF and AF stages, the 00 soft detector, plus the 12, 40, and 71 AF power amplifiers. (The last of this series to reach the market was the type 40 in 1927.)

The first dry cell tubes in general use were two tube series designated WD-11 and WD-12, introduced in 1922/23. These 1.1 volt filament tubes were electrically identical but had different bases. Much more commonly used was another dry cell series tube using a 3.3 volt filament—the general purpose 99 tube placed on the market in 1923, and the audio power amplifier version, introduced two years later, the type 20.

The bulk of the vacuum tubes of 1920's manufacture bear RCA or Cunningham tradenames. General Electric and Westinghouse (mostly GE) produced these tubes. Cunningham was a west coast distributor who obtained all his tubes from RCA. Thus the two are identical except for these tradename markings.

Many other tubes were developed during this era but are rarely found today in collections because they either were made largely for the manufacturer's own receiver line use or for a specialized purpose. deForest products represent the former trend, and transmitter and telephone repeater applications represent the later.

A few other RCA battery-set tubes were developed with possible home receiver use in mind but found only limited or short lived application, such as the type 22 (the only screen-grid tube with DC filaments), and types 10 and 50 power amplifiers.

Most of these tubes can be found at antique radio swapmeets. The most difficult to find will be the two WD's. Naturally this will be reflected in their price. Their popularity in the early 1920's was short lived as the 99 became the popular tube for dry cell use. The 40 had only a brief span of use and not too many of them were made. The 40 had a higher gain than the others in the 01 family and was designed for use in resistance-capacitance coupled amplifiers.

Don't be confused by the prefixes and suffixes of tube numbers, such as UX401A. Tube types are designated by just two numbers. The other indicators identify different manufacturers, or distributors, such as Cunningham's being 300 series when the corresponding RCA's (made in the same factory) are 200 series. A suffix "A" on the 01 series denotes a 1/4 ampere filament rather than the older 1 amp requirement. UV and UX designa-

tions indicate the older (short pin) or later (long pin) tube bases, respectively. The WD-12 was redesignated the WX-12 when it switched to a UX base.

Collectors will find numerous internal and external variations in tubes of a given type depending on when they were made. Changes were often introduced every few months. These changes are useful guides for dating tubes and often allow their production to be pinned down to almost exact dates.

The definitive treatment of the history of vacuum tubes of this period is Gerald Tyne's Saga of the Vacuum Tube, Howard Sams, Indianapolis, 1977. Various tube manuals published through the end of the 1930's usually have full information on the battery-era tubes including technical specifications. Advertisements in the popular radio magazines of the 1920's also give much interesting information regarding what was available at the time.

Cleaning Metal, Glass and Plastic

by Evan Powell

For cleaning or polishing metal or plastic, try a product called "Nevr Dull." Most antique stores sell it for about $3 per can. It even works well on glass, and the shine lasts a long time. And it is not messy to use – either. The product consists of a type of cotton batting material impregnated with chemicals. If you keep the lid of the can on tight, "Nevr Dull" lasts a long time. I've used it for several years. It's good stuff!

$498
for this

5-Room House
Freight Paid to Your Railroad Station
$968
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House

This handsome, modern, two-story dwelling shipped, freight paid to you for $968. Contains big living-room, open stairway, dining-room, kitchen, pantry, rear porch, three bed-roms, bath-room and closets. Full description in the Free Aladdin Catalog.

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THE DE LUXE U. S. NAVY TYPE RADIO RECEIVER

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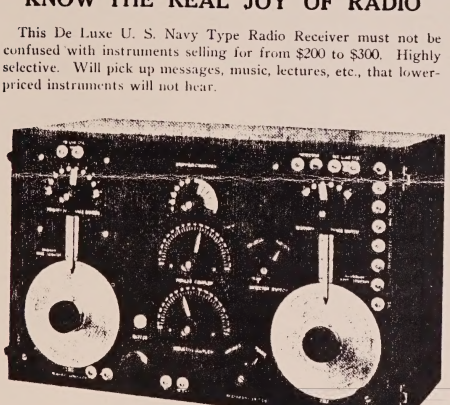
KNOW THE REAL JOY OF RADIO

This De Luxe U. S. Navy Type Radio Receiver must not be confused with instruments selling for from $200 to $300. Highly selective. Will pick up messages, music, lectures, etc., that lower-priced instruments will not hear.



Detail Description

THIS receiver is equipped with binding posts which are normally short circuited for 300 to 6800 meters by which wave lengths up to 23,000 meters may be received by the attachment of loading coils. Capacities of proper loading coils for above are: Primary 50; Secondary 50; Tickler 30 millihenries. While the receiver is provided with a "standby" or untuned circuit, it also has an unusual degree of selectivity. Although primarily designed for the more advanced fields of Radio work, or the laboratory, the simplicity of arrangement and beauty of finish make it unusually desirable for the radio club or for the individual who desires the finest equipment obtainable for his home or office. In the receiver, Bakelite tubes, threaded, provide the forms on which inductance coils of high frequency cable are bank-wound. After assembling, the coils are impregnated with an insulating compound, in vacuum, and thoroughly baked. The inductance switch controls a mechanism whereby the different sections may be connected, completely disconnected and opened, or completely disconnected and individually short circuited. This arrangement is important for, by it, each coil has a natural period when connected which is less than the shortest wave length in the receiver's range. The reception of parasitic signals is overcome, the absorption of desired signals by the coils is minimized, more energy is forced to the detector and on all wave lengths the interference is reduced.

For Immediate Christmas Delivery **$595** List Price

Write for special club or trade discounts

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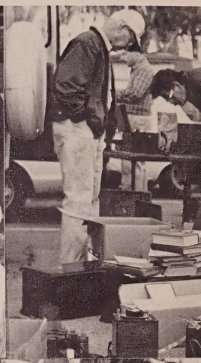
Swap Your House for a WWI Radio?

By Bob Herbig, W6ME

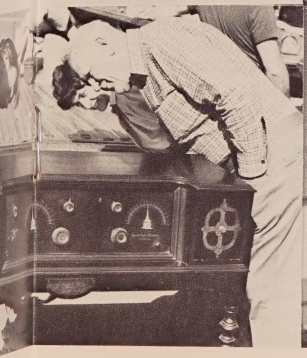
So you think that today's prices for WWI radios are high?

The two advertisements shown were taken from a 1922 issue of Radio World. The 1918 Navy SE-143 receiver (surplus) cost more in 1922 than a five room pre-fab house in the same year! The price of the SE-143 receiver has about doubled in the past 60 years, but a 5 room house has increased almost 150 times!

Burbank



Swapmeet



Radio History

Edison's Two Boo-Boos

By Roy and Kathryn Tucker

Almost all radio histories mention Thomas Edison's "near miss" of 1883 regarding his accidental discovery of what became known as the "Edison Effect." He found that a metal plate enclosed within one of his lightbulbs would attract electrons flowing from the hot filament and produce a completed circuit through the vacuum. While this is the principle upon which Fleming and deForest developed the vacuum tube, Edison neither determined the reason for the current flow nor made any practical use of it.

A far less known second Edison "near miss" involved his relationship with the person generally credited with the first successful demonstration of radio transmission and reception, Heinrich Hertz.

The year 1886 saw Hertz generating RF energy by way of a spark gap induction coil and a miniature dipole antenna. A few feet distant, and with no intervening wire connection, this radio energy was detected. The detector was a small ring of wire distinctly related in length to the dimensions of the transmitter's antenna, and broken in continuity by a very small gap. Sparks would jump cross the ring's gap simultaneously with a larger spark's crossing the transmitter's much larger gap—thus wireless emission and reception. But where did Hertz get the idea?

A possible explanation was given by Raymond Yates in an article which appeared in a popular radio periodical of the 20's. The article relates that Edison was an exhibitor at an industrial fair in Paris in the early 1880's and that his display booth featured a mysterious "black box." Also installed in the booth was an induction coil and spark gap. Edison demonstrated that any time this coil and large spark gap was sparking, an observer looking through a peep hole in the black box could see tiny sparks inside jumping crossing the tiny spark gap.

This demonstration by Edison was one of the high points of the exhibition. Many leading European scientists saw it. Neither they nor Edison could explain why one spark created the other. One of those that witnessed the demonstration was a young professor of physics from the University of Bonn, — Heinrich Hertz!

Leaving the fair, Hertz took the Edison idea back to his laboratory, duplicated it with a few refinements in equipment, concluded that he was demonstrating the electromagnetic waves discovered in Maxwell's theoretical calculations in the 1860's, and published his results.

As a consequence of his correctly identifying and explaining what was being done, correlating it with the behavior of light, and giving wide publicity to his findings, Heinrich Hertz has been recognized since 1887 as radio's scientific founder. But Edison appears to have given Hertz the first clue and Edison's failure to relate his experiment to Maxwell's theories constitutes his second "near miss."

If Edison's vacuum tube contribution is properly called the "Edison Effect," perhaps it would be appropriate to label his spark gap experiment as the "Edison Phenomenon." With over 1,200 patents to his individual credit (the all time record) in an enormous variety of electrical/mechanical/chemical fields, Edison could reasonably be excused for having twice come close, but "no cigar," in the realm of radio.

Homebrew

Those Thrilling Thirties

By Gary Legel, N6TO

Nostalgia for the 1930 to 1940 time frame of ham radio is a strong emotion of mine. I was licensed in 1934 as W9RTS in West Allis, Wisconsin. That period was one of the best times for enjoyment of ham radio. A CW transmitter could be built on a Saturday afternoon. A two-tube regenerative receiver took a little longer. But what a thrill to work CT1KZ on 40, using a Hartley 210, a Zepp antenna and a DC Pilot Super Wasp! The Super Wasp was a used one, acquired by judicious trading and the expenditure of profits from my early morning paper route. I will never forget that AC note from the Colpitts oscillator of CT1KZ, whose power supply was unrectified, raw AC. And when I received his QSL card, I was in Heaven!

My cousin, Al Estrumse, then W9SVQ, now W4KTS in Marietta, Georgia, also began his amateur radio hobby in those years. We had many a CW contact as he moved around the state of Wisconsin. WWII put an end to this. Al subsequently became a pilot in the Air Force, remaining in that service until eventual retirement as a Colonel.

A couple of years ago, Al and I resumed a long neglected relationship and again pursued our mutual interest in ham radio, holding frequent SSB schedules. But as it turns out we both have this intense interest in our first years of ham radio, to the extent that we each built breadboard replicas of our first transmitters. His was a TNT 45 rig and mine a Hartley 210. These are pictured in Photos A and B.

On New Year's Day 1979, at 3 a.m. PST, Al and I had a one-hour CW ragchew using these rigs. What Fun! The time of 3 a.m. PST was chosen because what these rigs do to a color television set is indescribable!

We repeated the performance on New Year's Day, 1980, 1981 and 1982. This time, I used a more modern set consisting of a 59 Tri-Tet crystal oscillator, 801 amplifier rig shown in Photo C. Note the Pilot Super Wasp receiver. Our intention is to work each other on subsequent New Year's Days, using this old gear.

Al and I are not alone in these endeavors. Harry Wells, W6YLC (SCARS member) has an extensive collection of breadboard transmitters, early receivers and transmitting tubes. His beautiful setup is shown in Photo D. The equipment is all operable and sees frequent use on the air.

At present in my workshop I am building a high power (100 watt) Hartley oscillator rig, using a WE242A tube picked up recently at a SCARS swap meet.

It is hoped that these words will bring back fond memories to the old timers out there and encourage others to join in the fun!

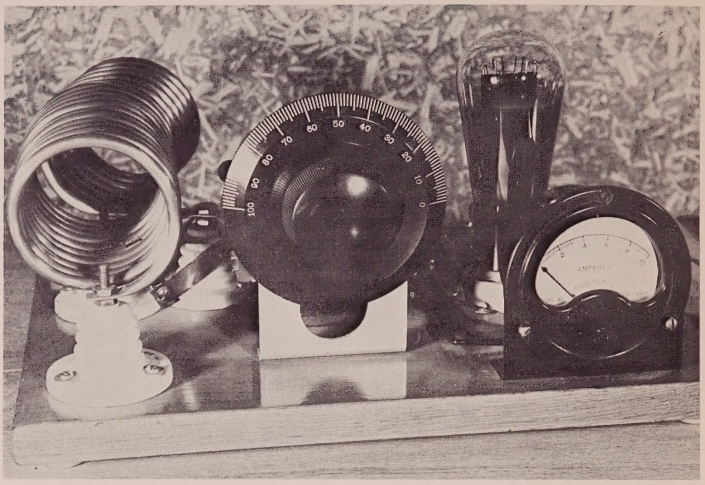


Figure A TNT 45 (W4KTS)

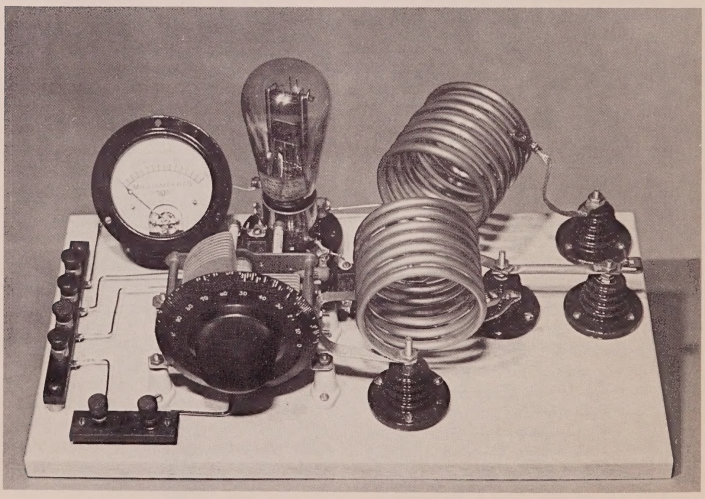


Figure B Hartley 210 (N6TO)

Figure C 59 Tri-Tet (N6TO)

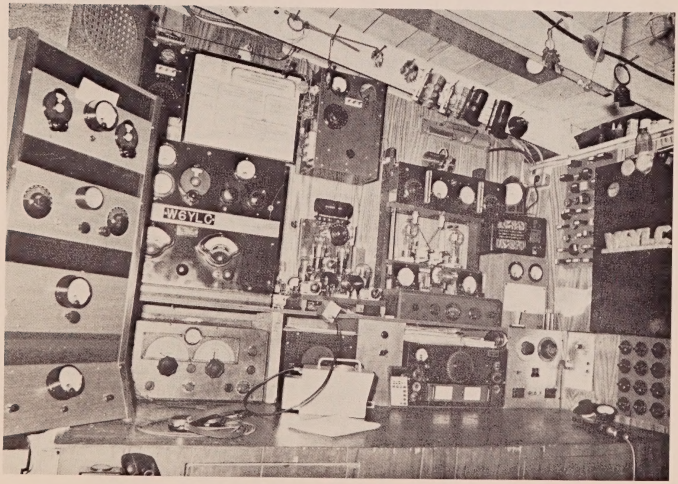


Figure D Good Old Shack (W6YLC)

Station 6XG

And The Big Event

By Ed Sheldon

"The Big Event" in 1921 was the Dempsey-Carpentier fight, which was scheduled to go on July the second. Just a few weeks before the fight, the Leo J. Meyberg Company of San Francisco announced that they would install a radiotelephone station, 6XG, in the Fairmont Hotel. The station was duly installed and began operation on 350 meters.

The transmitter featured a Cunningham C-302 tube and put out 5 watts. A Victor phonograph equipped with a "Magnavox Music Transmitter" was used for playing records "over the air." The station monitor receiver was a Grebe CR-6.

For several weeks prior to the fight the Fairmont station was in operation daily from 3 to 4 p.m. and on Monday and Thursday evenings from 8 to 9 p.m. musical programs were provided to hipe the event and to accustom the listeners to the "wavelength" envolved.

Listeners reported receiving the station as far north as Pullman, Washington and as far south as Los Angeles and San Diego. This is rather remarkable in view of the low power of the station, the limited number of listeners, and the state-of-the art of receivers in the hands of the average owner.

Public interest ran very high and it was reported that, "Visitors are allowed access to the station upon being furnished passes that are issued by application. All requests are filled in rotation, as only a limited number can be accommodated daily."

On July 2, starting at 10 a.m., listeners in the receiving area were promised a musical program until 11 a.m., at which time the first returns of the fight were expected to reach the newspaper offices of the San Francisco Bulletin. By a cooperative arrangement with that paper these returns were then immediately broadcast over 6XG from the Fairmont Hotel.

All the above has been condensed from an article appearing in the July 1921 Pacific Radio News. In the following issue, which I do not have, the reader is told there will be a circuit diagram and further details on construction of the Fairmont radio station.

I found this to be an interesting bit of radio history and wrote this article in the hope that one of our members could pick it up from here and write a sequel or a finish to "The Big Event" of 1921.

RCA-Radiotron UX-201-A

Detector
Amplifier

Radiotron UX-201-A is the equivalent of the well-known UV-201-A equipped with the new standard UX base. UX-201-A will fit both the old Navy socket and the new UX socket. This sturdy Radiotron has long been the accepted standard of every radio engineer, amateur and broadcast listener. It is the standard, all-round, flexible storage-battery tube of radio, good in detector or amplifier circuits, and sure to give the best results at the lowest operating cost.

The experimenter is referred to the data on pages 21 and 22 of this booklet in which are set forth the most efficient methods of using the Radiotron UX-201-A as a detector or as an amplifier.

All the results of modern electron-tube research are embodied in UX-201-A. Thus its "XL" filament has an electron emission which is not simply high, but extraordinarily high; and this at low current consumption and with long life.

Radiotron UX-201-A.....$2.00

Restoration Tip

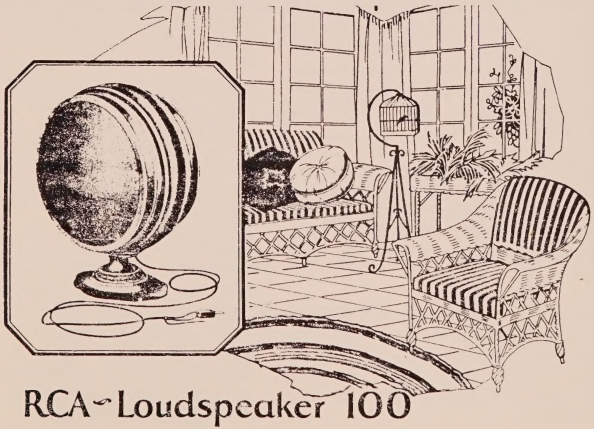
Removing Metal Tarnish

By Roy and Kathryn Tucker

One of the problems in cleaning old metal material is removing tarnish without leaving an artificial "cleaned up" appearance or extensive scratches. First, try to disassemble things as far as possible. Trying to polish material that is attached to other material usually leaves obvious cleaning marks where they shouldn't be. Sandpaper, emery cloth, wire brushes, files, and grind stones all have their place in metal restoration, but you can pay an enormous price in the scratches and gouges left behind.

One of the most useful cleaning devices to be found has recently been placed on the market for household paint work. Developed in Europe, but now sold in the U. S., is a sanding sponge. This is a rubber-like rectangular sponge with sandpaper-like surfaces. Several brands are available at hardware paint departments, including one called "Sandin-Block" and another called "Quicksmooth" (also called "Quicksand"). It can be used wet or dry.

To avoid excessive roughness, the sanding sponge should first be loosened up by some wood sanding use. This will wear off some of the sanding surface and expose some of the soft interior material. Using these sponges wet on metal objects will make their surface less abrasive. Be prepared for some finish removal on any form of painted or thinly plated surfaces, though, but by-and-large this sponge will do more good and less damage than any other rubbing instrument and it will not contaminate cracks with the solid deposit that liquid cleaners (such as silver polish or rouge) usually do.



RCA-Loudspeaker 100

For Sale or Trade & Want Ads

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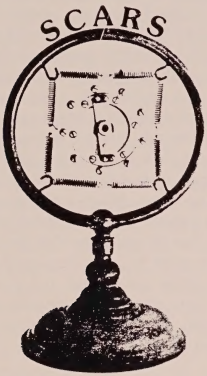


FOR SALE: Complete vintage radio collection. Over 100 valuable items plus 2000 tubes and parts, $8500. Not interested in fragmenting collection. Send SASE for list. Morgan McMahon, 26451 Dunwood, Rolling Hills Estates, CA 90274, (213) 375-4272.

WANTED: NATIONAL 1-10 coils, numbered A-1, A-2, B-1, etc., and power unit #5886AB per Rider Volume II. Bill Alvarez, WB6EYL, 19867 E. Vista Hermosa Drive, Walnut, CA 91789, (714) 595-5556.

WANTED: Horn for my RECREATER drive unit, or will trade my driver for plug coil forms, twenties type I. F. transformers, or what have you? Edward L. Sheldon, 656 Gravilla Place, La Jolla, CA 92037.

FOR SALE: Antique radio parts for RCA RADIOLA III, ATWATER KENT and PHILCO radios. Vintage receiver and transmitter tubes, new, used and surplus. Send SASE for parts needed. Elmer W. Shurman, 16424 N. E. 239 Avenue, Brush Prairie, WA 98606.

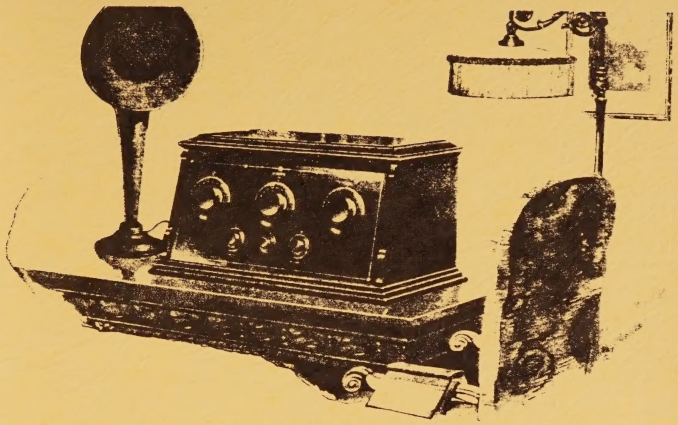
WANTED: Information on RADIO ENGINEERING LABORATORIES REL-278 regenerative receiver. Will share info on early history of the regenerative detector. John W. Crowe, W6ULZ, 22060 Independencia, Woodland Hills, CA 91364.

WANTED: One or two GENERAL RADIO receiving variable capacitors, 350 to 500 mmFD. Gary Legal, 1306 Sheppard Drive, Fullerton, CA 92631, (714) 870-0439.

FOR SALE: Tube tester, Triplett Model 3413A, $15. Gary Legal, 1306 Sheppard Drive, Fullerton, CA 92631, (714) 870-0439.

WANTED: Television sets and related items made before 1950 and color TV's made before 1955. I have early radio items to trade. Please send for list. Gerald Crulkey, Box 4193, Vallego, CA 94590, (415) 235-2071, evenings until 1:00 A. M.

WANTED: Original owners' manuals/instruction books (not schematic nor tech data sheets) for American Bosch 5A(1930); Grebe Synchrophase (1924); Kolster 45(1929); Majestic 50 (1930); Philco 20 (1930); Philco 86 (1929); Radiola 46 (1929). Send condition and price to L. Daniel, 50 Calhoun, Pueblo, CO 81001, (303) 542-1238.



The FADA Neutroceiver

will surpass anything you have expected of a radio receiver

VOLUME? The FADA Neutroceiver will give you all the controlled volume you can possibly desire. Designed to use powerful tubes and operate on either indoor or outdoor antenna, it is guaranteed to give powerful results.

Clarity? This wonderful, five-tube Neutrodyne offers you a tone quality which is unexcelled. It reproduces every tone of the human voice and of every musical instrument with lifelike fidelity.

Selectivity? Separates stations, tunes through powerful local broadcasting and brings in distant concerts—even when but a few meters apart.

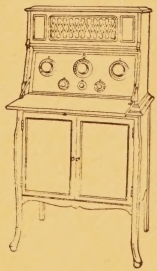
Simplicity of control? Anyone, without previous experience, can operate the Neutroceiver. You can turn your dials to previously located stations and bring them back night after night.

Beauty? As a piece of art-furniture, the FADA Neutroceiver is a masterpiece. The cabinet is solid mahogany, with the panel perfectly balanced and sloped gently to facilitate easy tuning.

Supplementing the FADA Neutroceiver and making a complete FADA line, are five other Neutrodyne receivers. Six models in all—three, four and five tube Neutrodyne receivers in plain as well as artcraft cabinets, at a price range from $75 to $295. See your dealer.

FADA "One Sixty"
No. 160-A
"The receiver that has taken the country by storm." The best known of all Neutrodynes. Four tubes. Price (less tubes, batteries, etc.) $120.

FADA Neutrola Grand
No. 185/90-A
The five-tube Neutrola 185-A, mounted on FADA Cabinet Table No. 190-A. Price (less tubes, batteries, etc.) $295.



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